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ROBERT BARTHOLOMEW, ET AL. CHILD WELFARE LEAGUE OF AMERICA, INC., NEW
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ABSTRACT

Suggested guidelines for designing indoor lighting and outdoor play space for child care centers are outlined in this booklet. It is recommended that, by focusing on the psychological and physiological needs of the children, decisions as to lighting, color, and playground design will evolve naturally. The guidelines were prepared based on the fact that young children in their learning environments need activity, opportunities for manipulating things, for exploring, for interacting with their peers, and for producing and changing things around them. (CS)

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Lighting and Color--Their Design and Use in Child Care Facilities

Honor Reynolds and Robert Bartholomew

Lighting, along with other design considerations, begins with a focus on the users, their activities and the building structure. From this orientation should evolve concepts of mood, character, task determination, glare avoidance and a general pleasantness that utilizes natural and artificial light where appropriate.

I. Some Physiological Considerations in Lighting

1. Visual comfort is an important consideration. Extreme brightness contrasts cause discomfort and fatigue, e.g., dark ceilings often cause discomfort, due to brightness between ceiling and lighting fixtures.

2. Highly luminous areas heighten sensitivity to contrast. Up to a point, colors, textures and other surface details are easier to see under high-light conditions.

3. Poor contrast requires higher light levels for a visual task. With this extra light, say a level of 70-200 footcandles, the high-contrast surroundings may reduce visual comfort. Large differences in light levels tend to wash out subtle colors and texture. One's eyes try to adapt to an intermediate brightness level without success; the bright surfaces appear uncomfortably bright, and the dark surfaces lose detail.

4. Daylight emphasizes cool colors, and incandescent lamps emphasize warm colors. Mercury vapor and fluorescent lights, depending on the color correction, tend to flatter cool colors, and produce a crisper atmosphere.

II. Lighting Design Considerations

1. Lighting needs generally do not vary due to the type of preschool, as being a nursery school, Head Start center, kindergarten or day care center specifically. Lighting will vary according to the physical layout of lamps and the usage (such as whether an area for napping must be provided).

2. Some variety in lighting in a preschool is generally desirable; both light and dark places should be provided. This helps add visual life and sparkle to an environment.

3. Safety and visual comfort must be kept in mind at all times.

4. Various areas in a preschool must be lighted differently; for instance, the book or reading area will generally need a higher level of illumination than the block area.

5. Visual interactions of lighting with the total environment must always be kept in mind--regarding color of walls, floors, ceilings, windows, carpets, size of rooms.

6. Physical integration of light, heating and cooling, as well as acoustical control, is possible.

III. Specific Lighting Design Recommendations

1. When lighting fixtures are in the center, rather than at the periphery, of the room, there is usually not adequate lighting near the sides of the room.

2. Contrast rendition- how well the contrast on a visual task is rendered is important. For close visual work, the area should be slightly brighter than the surrounding area.

3. Sources of high brightness should be unobtrusive and non-glaring; there should be no large areas of low brightness.

4. Table tops and floors should be high in light reflectance. The reflectance of the room surfaces greatly affect the overall efficiency of the lighting. However, glossy tables should be avoided because of glare. Recommended reflectances are 20-50% for the floor, 70-90% for the ceiling, 50-70% for a wall with windows, 15-20% for the opposite wall without windows, 35-50% for a desk or table top. (As a guide, use black and white as reflectance extremes.)

5. The footcandles is a common unit of illumination. Recommended footcandles for various visual tasks are: 20-30 for casual reading; 70 for prolonged reading or study; 100-200 for close work with small details. Footcandle guidelines are not ironclad, however.

6. Three basic types of light sources used today are incandescent, fluorescent, and high-intensity discharge lamps. Incandescent lamps are generally considered better than other lamps in color rendering, because people are used to this type of light, though more heat is wasted. However, fluorescent lamps are three to four times more efficient than incandescent lamps, and more economical, with less replacement and maintenance required, though they are initially more expensive. Good color rendition is possible with fluorescent lamps. (Cool white deluxe is a good overall lamp)

Natural light and Use of Windows

Natural light, with its continuing change, should also be considered in the lighting design, both from the point of view of control (e.g., glare), aesthetics or source of illumination. It, of course, is less predictable and steady than artificial sources, but also can provide desirable variety, change and view. Both skylights and windows can give natural light, or can become sources of light irritation or of a varying stimulus. Consider windows as view providers, visual rest centers, potential glare sources, ventilation, source of heat loss, condensation sources, solar heat admission and noise transmission route. The effects on bodily comfort, aesthetic sensibilities, cognitive efficiencies and social relationships can be considerable, providing a place for children to see weather changes, traffic, people, etc.

Color

Color selection for nursery schools, day care centers or any other human use environment is probably the most subjective and nonfactual area of physical planning. Because of color's emotional appeal and the directness of its influence, its use or misuse becomes readily apparent. The lack of objective data and research makes guidelines difficult to formulate. However, these suggestions are offered.

Color Function

Consider using color and graphics (large symbols, numbers, letters) to direct traffic and provide area identity. Large color symbols (numbers) that children can manipulate can be used to indicate date, place, etc. Consider a color spectrum along a wall to provide both identification and color education. Particular areas (reading area, for example) can be identified by specific colors.

The children can be involved in color selection and use if certain areas are set aside for the application of paint (a kind that can be washed off), color panels that can be changed at intervals, areas for hanging up of artwork, etc.

Color-Aesthetics

Color, particularly strong color, can involve personal preference, and is subject to many individual whims. Therefore, providing for color changes can satisfy both children's and teachers' need for color variation and give a high degree of stimulation to the environment. Because it is subjective, it is also liable to criticism or emotional differences.

Light colors can brighten a dull room or alter the appearance of space, form and distance. Important: Consider the quality and quantity of light in the space, plane or area where the color will be used. Color is dependent on light in order to be seen, and depending on the warmness or coolness of the source, be it natural or artificial, results can be startlingly different. For example, reds look excellent under warm white incandescent or any other warm light source, e.g., fluorescent, while blues look great under natural light or a cool white fluorescent lamp.

Color Psychology

Light substantiated research has been conducted either on psychological effects of color on children (or adults) or on color preferences of children. What research that has been conducted seems to indicate that warmer colors are preferred by younger children, with a gradual preference change to the cooler colors after age 6. Bright, intense colors also seemed to be high on the preference list. However, nothing conclusive is available at this time.

Coping with the Postage Stamp Playground
Sue McCord

If you are faced with a small area for the preschoolers' outdoor play and mini budget, you may find some help in this booklet. There are two main themes: a permanent structure of a shared play area that does not allow for permanent structures; and ideas for inspiring the use of both the asphalt and dirt playground. We have also drawn up a dual-function storage cart for carrying equipment out each day and for using in the room or out of doors as a climbing or sitting platform series.

I. The Small Play Area With a Minimum Budget for Permanent Equipment

The accompanying drawing (Fig. I) represents a possible solution for the small play area for preschool children. The highest point is 4 feet for the ramps and 5 feet for area (E) (the climbing sticks). We suggest marine plywood for the total structure and cargo nets for area (F).

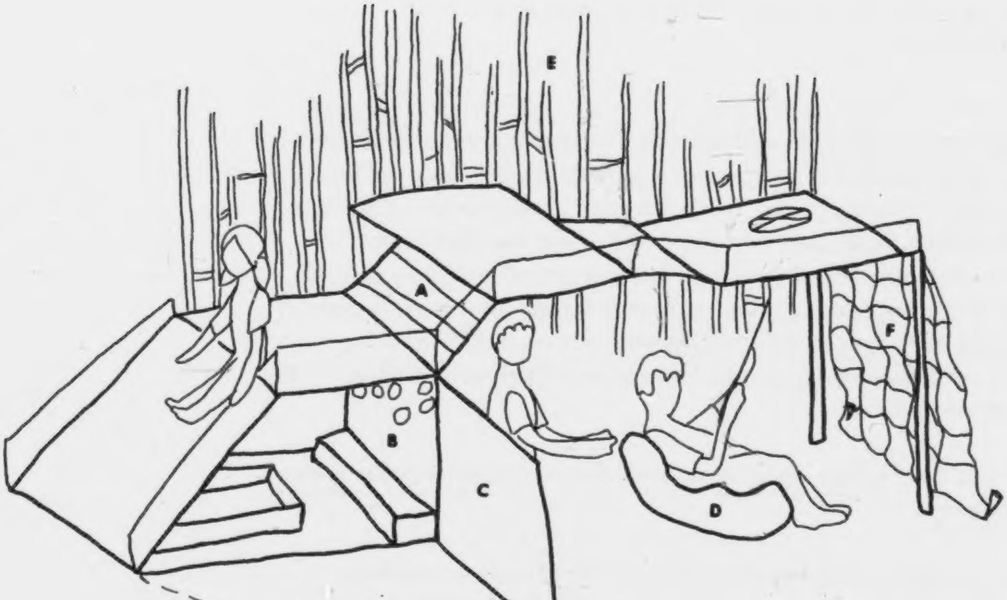

Fig. 1

The (A) spaces are for stairs, ramps or perhaps small cargo nets.

Area (B) is an enclosed sand-play space. We have suggested some holes in the walls for ventilation and some other holes for colored glass.

The door (C) can be locked closed and also locked in the open position. The door serves as a shield from the swing and provides a quiet place in the playground.

Area (D) is for a tire swing that is relatively clear of traffic pattern.

The main emphasis here is using a small area to satisfy the children's needs for safety, independence, active/quiet play, swinging, climbing, jumping, group or individual sliding, sand play, places to peek into, alternative routes for getting to the top, platforms for dramatic play, a place to be alone and surely the children will show us many other uses. (Fig.2)

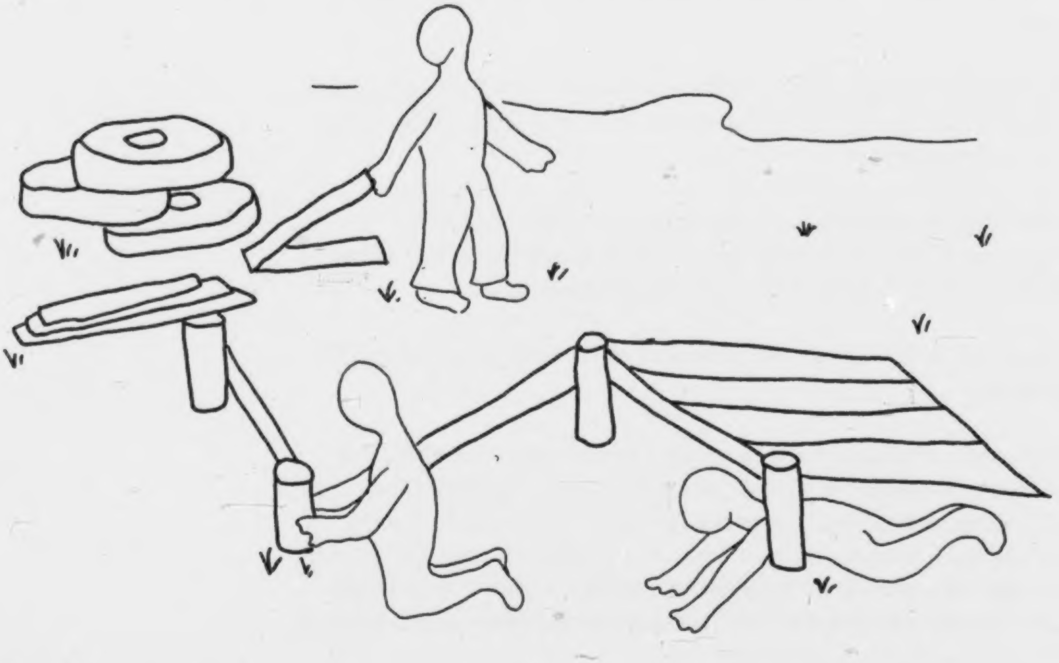

Fig. 2A

II. The Small, Shared* Play Area With No Budget and No Permanent Equipment

a. Ideas for use on the asphalt playground

- obstacle course using rope, chalk, blocks, tires, logs, sawhorses, boxes, coffee cans and boards as props.
- all sizes of rubber or yarn balls.
- bubble blowing. Carry soapy water out of coffee cans with plastic lids. Use glycerine to make bubble more substantial. (In the winter the bubbles freeze).
- water painting. (Use old paint brushes and coffee cans filled with water to "paint" the building, asphalt, fences, etc.).
- plastic lids from coffee cans for individual Frisbees.
- chalk hopscotch
- homemade kites
- paper planes
- parachutes. Tie to fence corners for a shady spot or for a place to hide under. Have children hold each corner and make the parachute billow over their heads.

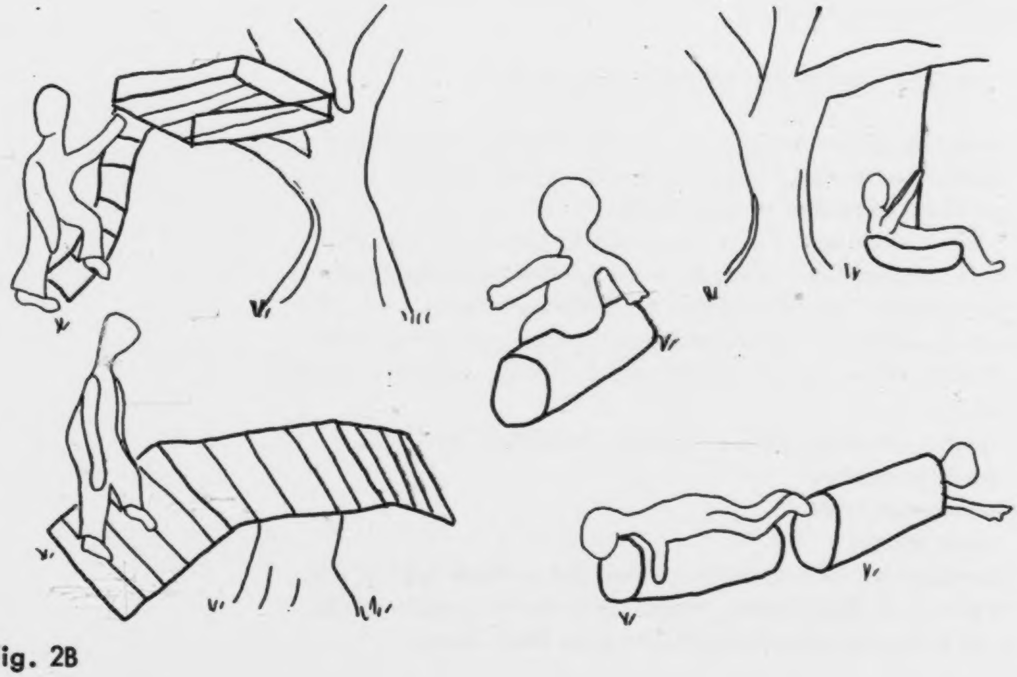

Fig. 2B

- pinwheels for windy days.
- hoola hoops for obstacle course, games or their intended use.
- coffee can stilts.
- scarfs for dancing and imaginary play.
- small table and blankets for instant houses.
- foam blocks.
- lying on back and watching clouds, planes, birds and so forth.
- texture drawing. Use painting paper and crayons, magic markers or pencils for texture rubbings of brick, asphalt, fences, boot bottoms, etc.
- drawing around child with chalk or having him draw around shadows with chalk.
- using colored chalk for drawing on asphalt.
- chalking roads and small matchbox cars.
- snow. Shovel, pile up for sliding, color with food coloring or water colors, compare footprints, put new-fallen snow in Dixie cups and pour maple syrup over it for a "snow sundae."

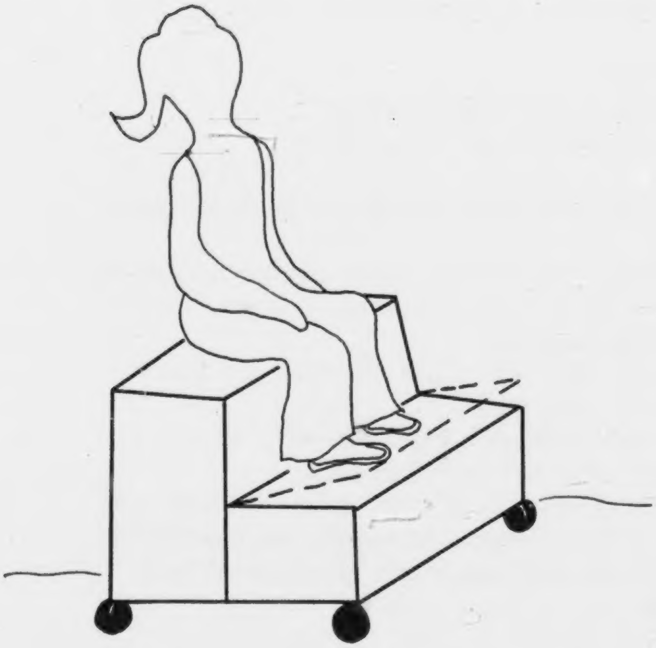

Fig. 3

*Shared here means that this area is perhaps used by either groups of children who need the area for ball playing and the like.

For those who have to transport equipment from the classroom to the playyard, here is a suggestion of a dual-purpose storage unit on casters. (Fig. 3) The "stairs" serve as two separate storage units. The tops of the stairs open and close and can be used for seats, a stage platform, or as a part of an obstacle course, to mention a few ideas.

b. Ideas for the Dirt Playground.

Many of the asphalt-area ideas can be used on the dirt play areas too. The following are suggestions feasible in dirt playgrounds.

- digging with spoons, shovels and strong plastic containers.
- playing with water and making mud.
- planting seeds.
- looking for bugs, beetles and worms.
- investigating what is under different kinds of ground bumps.
- building with rocks and sticks. (Bring out small cars for

road building.)

- making footprints. If you use firm mud, a footprint, twig or rock print or the like can be cast in plaster. Just make mud, put foot down firmly, lift and pour plaster of paris in the "mold." Let it dry for 10 minutes and carefully lift plaster out.
- racking leaves. Take an adult-size rake and saw off the large handle to make it child size. Sand the rough top, and children can rake without poking each other.
- dirt drawing. Use twigs for drawing tools and watch the variety of approaches.
- drawing abstacle courses on dirt. Many of the props from the asphalt course can be used.
- drawing around children in the dirt. Have a child lie down and trace his outline in the dirt or just trace his feet, hands or shadow.

These ideas are a beginning. Brainstorm with your staff and parents to see what new suggestions you can come up with for the limited play space, with the guidelines of safety, fun and incidental learning.

Guidelines For Designing Playgrounds for Nursery Schools and Day Care Centers

Robert Bartholomew and Helen Stein

1. Introduction

If play-space designers attended to the motivations and drives of young children, they would probably design differently. Young children need activity, opportunities for manipulating things, for exploring, for interacting with their peers, for producing and changing things around them.

Some playgrounds have been designed to give children opportunities to build and destroy, dig, make fires, cook, garden-for example, the Adventure Playgrounds in Scandinavia and England and the Robinson Playgrounds in Switzerland. C.T. Sorensen, a Danish landscape architect, designed the first adventure playground in Denmark after he had observed that children preferred bombed-out lots to playgrounds. He provided tools, scrap lumber and other junk, and the children built towers, swings, dens, treehouses. The environment presented problems to solve, resources for imaginative play, large motor activity, manual skills, cognitive development, and necessities for cooperation.

Unfortunately there has been little systematic rigorous research on children's use of playgrounds. Informal observations have been made by several investigators, bearing out the foregoing conclusions. The purpose of the following outline is to describe the needs of the people who use the playground, and to recommend ways of providing for these needs.

II. Needs of Playground Users

A. Children

1. Safety Needs

a. Equipment

1) Should be scaled to the children's size.

2) Should be inspected for sharp edges, etc.
3) Swings: Must be anchored in the ground; metal swings are dangerous, and rubber or canvas or tire swings can be substituted; space should be provided around swings so children can wait for their turn.
4) Slides: Must have large or fenced in platforms at the top, large enough to accommodate several children.

b. Surfacing: There should be grass, sand or rubber mats at the bottom of slides and underneath climbing equipment.

c. Traffic patterns (e.g., tricycle paths). Separate activity areas are a means of preventing collisions and conflicts.

d. Indoors and toilets: Should be easily accessible.

e. Sand box: Should be placed in a sunny area, since exposure to sunlight and air keeps the sand clean. If animals have access to the sand area, there should be a cover for it (or it might be elevated).

2. Developmental Needs

a. Large motor: Should be pipes for crawling through, jungle gyms, nets, treehouses, etc., for climbing, hills for rolling down and climbing up, dirt for digging, tires for swinging and pushing, water for wading, space for running, etc.

b. Small motor: Provide sand and water play, woodworking, painting, clay.

c. Cognitive: Using pulleys and seesaws, watching the seasons change, planting a garden, learning how to build a fire.

d. Social and Emotional Development

   1) Creativity: Giving the child opportunities to change his environment, use different materials and produce things.
   2) Independence: Stimulating curiosity, feelings about self.

3) Cooperation: Providing activities that require children to help one another (e.g., swinging).
4) Privacy: Creating spaces that offer children a refuge from the activity of larger groups.
5) Social Interaction: Using complex and super play units that can accommodate several children at once and lend themselves to more than one activity (e.g., sandbox with shovels, wheelbarrows, pails).
6) Role Playing: Facilitating by the addition of small props. In her observations of the playground she designed in Boston, Robin Moore noted the importance of apparently insignificant props in stimulating involved sequences of dramatic play.
7) Frustration tolerance: Providing graded challenges that are scaled to the children's size but are diverse enough to keep them interested.
8) Feeling about self

3. Spatial Needs

1) Activity areas should flow into one another so that

a child can move easily from one activity to another and not reach a dead end.

2) Spaces for different kinds of activity should be separated so that activities don't take place at cross purposes.
3) Paths can be used to link spaces, to lead the child from one space to another.
4) Small protected spaces should be provided for privacy.

B. The Staff

1. Supervision

a. The playground must be designed so that the teacher has vantage points from which he can see and/or hear the children.
b. By providing varied activities that the children can carry out together with a minimum of frustration and boredom, the need for active intervention by the teacher is reduced.

2. Access to the Indoors

a. The ideal situation is for the nursery school classroom to open out onto the playground, with a covered area immediately outside the classroom.

b. There must be easy access to toilets and cubbies from outdoors, so the teacher does not have to accompany individual children for brief trips indoors.

3. Cost and Maintenance of Equipment

a. Most playground equipment can be constructed by willing parents from scrounged materials. Junk collected from the junk yard has more appeal than sculptured forms, which quickly lose their interest and cannot be changed.

b. Vandalism can be reduced by supplying materials and equipment that allow the child to manipulate, change, take apart.

c. Ample storage must be provided

    1) Equipment the children use frequently should be stored so that it is easy for them to take it out and

put it back.

2) Equipment with more restricted use should be stored accordingly.

III. Specific Recommendations

A. Surfacing: Maybe tough grass (not over-mown) that can stand hard usage. Other possibilities include plain earth, a mixture of compressed cinders and peatmoss, sea sand; difference patterns and textures of paving. Also:

1. Hard-surface area for games
2. Paved paths for wheeled toys
3. Digging area of clean earth
4. Puddle area
5. Soft surfaces under jungle gyms, at bottom of slides

B. Contours: Take advantage of differences in play-area levels as windshields. Steps can be built into them, and pockets left at the bottom for sand areas or pools. Sharp corners should be avoided; they restrict running and free shapes are easier to maintain. Contours also are good placed for built-in slides, rolling, running or area separation.

C. Sand Area: An irregularly shaped area of about 400 square feet with sand at least 16 inches deep, open to sun, wind and rain, and near a source of water. Sand areas can be walled in to contain the sand and protect children from wind, or elevated, or contain stepping stones.

D. Water: Fountains, sprinklers and/or pools. One arrangement is to have tanks at various heights connected by channels, with a pump to circular water. Any pool should be shallow for safety and easy cleaning. One Head Start Center used a leaky old boat as a wading pool.

E. Construction or Adventure Area: Provide junk materials bricks, stones, sticks, tires, ladders, ropes, sewage pipes, sawhorses, tree trunks, dirt, big blocks, planks, frames, crates, tubs, barrels, sawdust, etc. - and tools hammers, nails, saws, shovels, pails, etc. (See illustra-

tion.) The choice of tools and materials will depend on the age of the children and the amount of adult help they can depend on. This area might include space for a garden and for fire building.

F. Nature and Pet Area

G. Movable Materials Area : Tables for carpentry, table games, clay, large blocks, walls to paint on.

H. Storage: Can be designed to serve other needs as well - for example, an A-frame shed that could be used for climbing or sliding. (See illustration.)

I. Fencing

J. Litter Baskets

K. Equipment

I. Slide

2. Swings
3. Climbing apparatus: Trees planted in concrete, nets, towers, jungle gyms, treehouses (See illustration), tunnels
4. Vehicles: Wagons, tricycles
5. Old vehicles: Automobiles, boats, etc.
6. Planks to make seesaws, balance beams
7. Balls
8. First-aid kit

One good method of generating ideas for play area is to list the children's activity or behavior (actual or desired) such as running, digging, talking, exploring, jumping, splashing, etc. The next step is to find materials, structures, games, places or natural resources to satisfy or encourage these activities. This method is most successful in a brain-storming session of four to six diverse, openminded individuals. After the idea exchange, the hard judgments, idea sifting, development and elimination are done.

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